## REMARKS/ARGUMENTS

Reconsideration of the application as amended is respectfully requested.

### Status of Claims

Claims 1, 2 and 4-21 are pending in the application, with claims 1, 14 and 17 being the only independent claims. Claim 3 has been canceled, without prejudice.

Claims 1, 2, 14, 17, 19 and 20 have been amended. Applicants respectfully submit that the amendments to the claims do not raise any new issues that would require further consideration and/or search by the Examiner.

### Overview of the Office Action

Claims 1, 4 and 6-21 stand rejected under 35 U.S.C. 102(b) as anticipated by EP Patent Application No. 1263031 (*Koike*).

Claim 2 stands rejected under 35 U.S.C. 103(a) as unpatentable over *Koike* in view of Hageman et al. (*Hageman*).

Claim 5 stands rejected under 35 U.S.C. 103(a) as unpatentable over *Koike*.

### Summary of the Prior Art and the Subject Matter Disclosed in the Specification

*Koike*

*Koike* discloses a method for producing a Group III-nitride compound-semiconductor component by means of epitaxial growth, wherein a mask layer (4) is used to etch a layer (31) formed of a first Group III-nitride compound-semiconductor. This first Group III-nitride compound-semiconductor layer (31) is formed on a substrate (1) via a buffer layer (2). Trenches

(no assigned reference numeral in the drawings) are formed in the first semiconductor layer (31). A second Group III-nitride compound-semiconductor layer (32) is epitaxially grown, vertically and laterally, within the trenches. *See* Fig. 1A; and paragraphs [0019] and [0030] of *Koike*.

A key point to keep in mind is that in *Koike* the trenches are formed in first semiconductor layer (31), not in the substrate (1), and that the growth of the second semiconductor layer (32) is from the sidewalls formed from the first semiconductor layer (31), not from the substrate (1). *See* Figs. 1D and 1E, and paragraph [0030] of *Koike*.

*Summary of the Subject Matter Disclosed in the Specification*

In contrast, the present application discloses the surprising discovery that the semiconductor material (Group III-nitride compound-semiconductor material) (5) can be laterally grown on the flanks of pits (41) formed within the substrate (1). Thus, there is no need to form the pits (or trenches) within an additional semiconductor layer, i.e. the first Group III-nitride compound-semiconductor layer (31) of *Koike* is eliminated.

In summary, the present specification reveals that there is no need for *Koike*'s first Group III-nitride compound-semiconductor layer (31) into which the trenches were etched. In one embodiment of the present invention, the mask layer is arranged directly onto the substrate (1), and the pits (41) are etched directly into the substrate (1). Thus, this arrangement provides the significant advantage of fewer layers and, therefore, lower costs as compared to the method described by *Koike*.

In another embodiment of the present invention, a second mask layer is formed on the semiconductor material (5). The second mask layer has a plurality of windows leading to the semiconductor material (5). Then, a second semiconductor material is deposited on the

semiconductor material (5) through the windows of the second mask layer. *See* paragraph [0031] of the published specification.

The above descriptive details are based on the present specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations which are unclaimed.

**Arguments**

Independent Claim 1

Applicants respectfully submit that claim 1, as amended, is not anticipated by *Koike* because *Koike* does not disclose, either expressly or inherently, each and every element as set forth in claim 1. In particular, *Koike* does not teach or suggest etching a substrate in the windows of a mask layer in such as manner that pits are formed in the substrate, or growing the semiconductor material onto the substrate.

Prior to this amendment, claim 1 recites "etching back the substrate (1) or the initial layer (2) in the windows (4), in such a manner that pits (41) are formed in the substrate (1) or in the initial layer (2)".

In the final Office Action, the Examiner maintains the rejection of claim 1 under 35 U.S.C. 102(b) as anticipated by *Koike* on the ground that the underlying layer (20) of *Koike* constitutes an initial layer.

Claim 1 has been amended hereinabove to eliminate any mention of the initial layer (2). As discussed above, in *Koike* the trenches are formed in the first semiconductor layer (31), not in the substrate (1), and the growth of the second semiconductor layer (32) is from the sidewalls formed from the first semiconductor layer (31), not from the substrate (1). Thus, *Koike* does not

teach or suggest etching a substrate in the windows of a mask layer in such a manner that pits are formed in the substrate, or growing the semiconductor material onto the substrate in such a manner that the semiconductor material initially grows primarily from the flanks of such pits.

In sharp contrast, amended claim 1 now specifically recites "etching back the substrate (1) in the windows (4), in such a manner that pits (41) are formed in the substrate (1) starting from these windows" and "growing the semiconductor material (5) onto the substrate (1), in such a manner that lateral growth is promoted and (i) the semiconductor material initially grows primarily from the flanks (43) of the pits".

The Examiner also refers to col. 10, lines 40-49 of the U.S. counterpart of *Koike* (paragraph [0045] of *Koike*), and contends that *Koike* discloses that the underlying layer (20) can be used as a substrate.

The Examiner's interpretation, however, is incorrect.

Paragraph [0045] of *Koike* discloses that the "semiconductor having regions where threading dislocation is suppressed" can be formed as a substrate, after the removal of the substrate (1), the buffer layer (2) and portions of the Group III nitride compound semiconductor where threading dislocation is not suppressed. This expression "semiconductor having regions where threading dislocation is suppressed" does not, however, refer to the underlying layer (20) or the first semiconductor layer (31). Rather, this expression specifically refers to the second semiconductor layer (32) because during an earlier discussion *Koike* uses a similar expression to describe the second semiconductor layer (32) ("whereby threading dislocation is suppressed in the regions of the second Group III nitride compound semiconductor 32 formed above the bottoms of the trenches"). *See* col. 9, lines 29-32 of *Koike*.

Using the second semiconductor layer (32) as a substrate does not anticipate claim 1 because to follow the method disclosed in *Koike* one would still require (a) applying a first semiconductor layer (31) and a mask layer (4) on such a substrate; (2) etching the first semiconductor layer (31) to form trenches therein, while leaving such a substrate intact; and (c) growing another semiconductor layer (32) from the first semiconductor layer (31). In other words, there are still no trenches formed in such a substrate.

In view of these differences, withdrawal of the rejection of claim 1 under 35 U.S.C. 102(b) is respectfully requested.

Moreover, the differences between the claimed invention and *Koike* are so fundamental as to clearly render the claimed invention allowable thereover under 35 U.S.C 103.

Independent Claim 14

Independent claim 14 is patentable for reasons discussed above in connection with independent claim 1. Therefore, withdrawal of the rejection of claim 14 under 35 U.S.C. 102(b) is in order.

Independent Claim 17

Independent claim 17 has been amended to recite "forming a second mask layer" and "depositing a second semiconductor material on said first semiconductor material".

Applicants respectfully submit that *Koike* fails to disclose, either expressly or inherently, the above recitations of independent claim 17.

*Koike* is silent on repeating its method by forming a second mask layer on the second semiconductor layer (32) in order to grow another semiconductor layer on top of the second semiconductor layer (32). If the Examiner remains of a contrary view, he is respectfully requested to point out exactly where in *Koike* support for such a view exists.

In view of the foregoing, withdrawal of the rejection of claim 17 under 35 U.S.C. 102(b) is respectfully requested.

Dependent Claims 2, 3-13, 15 and 18-21

Each of claims 2, 4-13 and 16 depends on claim 1 and, thus, is allowable therewith.

Claim 15 depends on claim 14 and, thus, is allowable therewith.

Each of claims 18-21 depends on claim 17 and, thus, is allowable therewith.

**Conclusion**

Based on all of the above, it is respectfully submitted that the present application is now in proper condition for allowance. Prompt and favorable action to this effect and early passing of this application to issue are respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

It is believed that no fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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